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Charged rho-meson condensate in neutron stars within RMF models

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Knowledge of the equation of state (EoS) of cold and dense baryonic matter is essential to describe the properties of neutron stars (NSs). With an increase of the density new baryon species can appear in NS matter, as well as various meson condensates. In previous works we developed relativistic mean-field (RMF) models with hyperons and Δ-isobars, which passed the majority of known experimental constraints, including the existence of a $2\,M_\odot$ neutron star. In this contribution we present results of inclusion of ρ^--meson condensation into these models. We have shown that in one class of the models (so-called KVOR-based models, in which the additional stiffening procedure is introduced in isoscalar sector) the condensation gives only a small contribution to the EoS. In other class (MKVOR-based models with additional stiffening in isovector sector) models the condensation can lead to a first-order phase transition and a substantial decrease of the NS mass. Nevertheless, in all resulting models the condensation does not spoil the description of the experimental constraints.

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